

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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REC'D 23 SEP 2005

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) 23 SEP 2005		
Applicant's or agent's file reference GRA26 029 PC		
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/US05/16748	International filing date (day/month/year) 11 May 2005 (11.05.2005)	Priority date (day/month/year) 12 May 2004 (12.05.2004)
International Patent Classification (IPC) or both national classification and IPC IPC(7): H04B 7/15 and US Cl.: 455/11.1		
Applicant ANDREW CORPORATION		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer <div style="text-align: center;"> Edan Orgad </div> Telephone No. 571-272-7884
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Form PCT/ISA/237 (cover sheet) (January 2004)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US05/16748

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
- a. type of material
- ☐ a sequence listing
- ☐ table(s) related to the sequence listing
- b. format of material
- ☐ in written format
- ☐ in computer readable form
- c. time of filing/furnishing
- ☐ contained in international application as filed.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US05/16748

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-35</u>	YES
	Claims <u>NONE</u>	NO
Inventive step (IS)	Claims <u>1-35</u>	YES
	Claims <u>NONE</u>	NO
Industrial applicability (IA)	Claims <u>1-35</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1-3 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a wireless communication system comprising: a plurality of base stations and at least one repeater, the at least one repeater comprises: a receiver for receiving a primary signal; a transmitter for transmitting a first signal; a modification circuit for modifying the primary signal into the first signal, the modification circuit comprising: a cyclic shift register, a signal multiplier and a signal adder; the cyclic shift register and the receiver being connected to inputs of the signal multiplier, the receiver and output of the signal multiplier being connected to inputs of the signal adder; and, the output of the signal adder being connected to the transmitter.

Claims 4-16 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a communication system including a primary receiver, a primary transmitter, and a repeater that applies a known modification to a primary signal passing there through that identifies the repeater, where the primary receiver receives a first signal from the primary transmitter either directly or via the repeater, and where the first signal includes a primary signal and, if the first signal is received from the repeater, also includes a secondary signal that is a function of the primary communication signal and the known modification applied by the repeater, the method of determining if a signal received by the primary receiver is received directly from the primary transmitter or indirectly through the repeater, comprising the steps of: receiving the first signal at the primary receiver; outputting the primary signal from the primary receiver; receiving the first signal at a secondary receiver and obtaining the primary signal from the primary receiver; applying an inverse function of the first signal and the primary signal to retrieve a modification; and determining whether the first signal has been received from the repeater by comparison of the modification and the known modification.

Claims 17-23 meet the criteria set out in PCT Article 33(2)-(3) because the prior art does not teach or fairly suggest a communication system including a first node, a second node, and a repeater, wherein the first node receives a first signal from the second node either directly or via the repeater, a method of applying a known distortion to a signal to enable a determination of a signal received by the first node is received directly from the second node or indirectly through the repeater, comprising the steps of: at the repeater receiving a primary signal and creating a secondary signal as a function of the primary signal and a known modification, wherein the known modification identifies the repeater; and transmitting the primary signal injected with the secondary signal as the first signal to the primary receiver.

Claims 24-35 meet the criteria set out in PCT Article 33(2)-(3) because the prior art does not teach or fairly suggest a wireless communication system having one or more repeaters, a first node and a second node, a method of determining if a signal received at the first node is received directly or via one of the one or more repeaters comprising: creating, at the one or more repeaters, a composite signal $w(t)$ that is a function $f(r(t), s(t))$ of a primary signal $s(t)$ received from the second node and a known identification signal $r_k(t)$, where $r_k(t)$ is unique for each of the one or more repeaters; transmitting the composite signal to the first node; detecting at the first node the primary signal $s(t)$; determining an identification signal $r(t)$ from an inverse function $g(w(t), s(t))$ of the composite signal $w(t)$ and the primary signal $s(t)$, where g is the inverse of f ; and determining if the signal is received via the one or more repeaters based at least in part by the identification signal and the known identification signals of the one or more repeaters.